

**Luminescence and Site Distribution of
Divalent Europium Ions in
 $\text{BaMgAl}_{10}\text{O}_{17}$ (BAM)**

M. Raukas, K.C. Mishra, Central Research,
Osram Sylvania, Beverly, MA

A. Ellens, R&D OSRAM, Munich,
Germany

M. Berkowski, J. Fink-Finowicki, P.
Byszewski, Inst. of Physics, Polish
Academy of Sciences, Warsaw, Poland

P. Boolchand, Dept. of Electrical
Engineering, U.Cincinnati, Cincinnati, OH

Search for efficient and robust luminescent materials for PDPs and highly loaded lamps continues since a majority of phosphors currently being used or studied exhibit various problems. $\text{BaMgAl}_{10}\text{O}_{17}$ doped with divalent Eu (BAM) is widely used as a blue phosphor in a number of applications. Equally known are the shortcomings in its brightness and maintenance [1]. We studied the material in single and polycrystalline form for determining the location of Eu ions in this complex lattice and the luminescence mechanisms using a variety of experimental and computer modeling methods. Reflectance, excitation, emission and time-resolved studies in VUV-UV range will be presented and analyzed in the context of different environments in activator coordination. These results are compared with the picture of Eu^{2+} ions obtained from Mössbauer spectroscopy. Finally, molecular orbital cluster calculations (by SCF-X α -SW method) will be used for a more detailed interpretation of experimental data. The likely luminescence mechanism will be outlined and its validity discussed in the context of maintenance problems.

1. S. Oshio, K. Kitamura, T. Nishiura, T. Shigeta, S. Horii, T. Matsuoka, National Technical Report 43, (1997) 181.